

REMARKS

Favorable reconsideration and allowance of the claims of the present application are respectfully requested.

In the Final Office Action, the drawings are objected to under 37 CFR 1.83(a) for not showing every feature of the invention specified in the claims. Specifically, the Examiner objected to the absence of at least one other type of memory device (Claim 2) in the figures.

Applicants submit that specific showing of at least one other type of memory device is not necessary for the understanding of the claimed feature of the invention and that one of ordinary skill in the art would easily construct at least one other type of memory device. 35 U.S.C. § 113 states that the Applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented.

In the case of the present invention, the description of the at least one other-type of memory device in paragraph [0014] states “each of the at least one other-type of memory device comprising another transistor and another underlying capacitor that are in electrical contact to each other through a further-offset buried strap, the further-offset buried strap positioned on another collar region, wherein the other collar region has a length equal to the second collar region and the first collar region.” While the description of the at least one second-type memory device in paragraph [0013] states “each of the at least one second-type memory device comprises a second access transistor and a second underlying capacitor that are in electrical contact through an offset buried strap, the offset buried strap positioned on a second collar region, wherein the second collar region has a length equal to the first collar region.” There is a word for word correspondence between the description of the at least one other-type of memory device and the at least one second-type memory device except for the words another versus second that

differentiate the labeling of the devices and the words offset versus further-offset qualifying the location of the buried strap. The word “offset” is used in the specification to describe differences in vertical height between two elements. This is clear from the figures when the location of the first buried strap is compared with that of the “offset” buried strap.

Also, in the specification, the word offset is used in paragraph [0016] to describe a difference in the vertical height of two similar elements. Quoting paragraph [0016], “etching a substrate to provide a first trench having an initial depth and a second trench having an intermediate depth to produce an offset between the first trench region and the second trench region in a vertical dimension;” the word “offset” refers to differences in the vertical dimension between similar elements. The word, “offset” is repeatedly used to describe the spatial relationship of differences in the vertical height in paragraph [0018], [0022], and [0024].

Furthermore, paragraph [0024] refers to “another-offset” buried strap, which is a different way of referring to “further-offset” buried strap. Quoting paragraph [0024], “The method for forming a memory array with offset buried strap regions and equal length oxide collars may also comprise forming another trench having another-offset buried strap and equal length collars.” The paragraph [0024] in combination with paragraph [0014] teaches the structure and method of manufacture of a third kind of buried strap with a different vertical depth than the first buried strap or the second buried strap.

To describe a new element in an invention, a new label must be introduced to identify the new element. For the “other-type memory devices,” this is achieved by a new qualifier, “another” as opposed to “second”. Therefore, the only material difference between the second type memory device and other-type memory device is the differences in the words “offset” and “further-offset”. Since the meaning of the word “offset” is clear throughout the specification

both in figures and in the paragraphs, the meaning of the word “further-offset” is also clear in the meaning, that is further differences in the vertical height of comparable elements from the corresponding elements of the first kind and of the second kind. In this particular case, one of ordinary skill in the art would easily deduce that the vertical height of the “further-offset” buried strap is different from the vertical height of the first buried strap or the vertical height of the offset buried strap.

Since all the details of the first-type memory device and second-type memory device are clearly described in the specification and the existing figures alone, with the only difference between them being the placement and vertical height of specific elements, one of ordinary skill in the art would be able to construct a structure containing “further-offset” buried strap, and therefore other-type of memory devices as well. Therefore, an additional drawing illustrating the other-type memory device is not necessary for the understanding of the present invention, including the features in Claim 2.

In the Final Office Action, Claims 1, 2, 5-7 and 10 stand rejected under 35 U.S.C. § 102(e) as allegedly anticipated by Chen et al., (US PG Pub 2005/0190590, hereinafter Chen). Claim 1, 5, 6, and 10 stand rejected under 35 U.S.C. § 102(a) as allegedly anticipated by U.S. Patent No. 6,570,207 to Hsu et al., (hereinafter Hsu). Claim 3 stands rejected under 35 U.S.C. § 103(a) as allegedly obvious over Hsu. Claim 4 stands rejected under 35 U.S.C. § 103(a) as allegedly obvious over Hsu in view of U.S. Patent No. 6,605,838 to Mandelmann et al., (hereinafter Mandelmann). Claim 21 stands allowed. Claim 8 and 9 stand objected to as being dependent on a base claim, but the Examiner indicated that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In response, Applicants amended Claim 1 and Claim 2 to positively recite all features of the present invention. No new matter has been introduced in either Claim 1 or Claim 2.

Specifically, Claim 1 was amended to list all components of “each of said at least one first-type memory device”, which are a first transistor, a first underlying capacitor, a first buried strap, and a first collar region. The Examiner noted that it can be considered that the at least part of collar 46 has “a length” equal to the length of the other collar region. The Examiner further noted that the limitation “a length” can be considered part of the total length. In response, an inherent property of the first collar region was specified, which is the vertical length of the first collar region, by qualifying the first collar region with the phrase “with a first vertical length.” The phrase “with a first vertical length” as an inherent property of the first collar is supported by paragraph [0034] of the specification, which include a passage, “the present memory array 5 further comprises equal length oxide collar regions 23, 24, where the vertical length L3 of the oxide collar 23 of the first-type memory trench device 21 is equal to the vertical length L4 of the oxide collar 24 of the second-type memory device 22.”

Similarly, Claim 1 was amended to list all components of “each of said at least one second-type memory device”, which are a second transistor, a second underlying capacitor, an offset buried strap, and a second collar region. An inherent property of the second collar region was also specified, which is the vertical length of the second collar region, by qualifying the second collar region with the phrase “with a second vertical length.”

The equality between the first vertical length and the second vertical length was also positively specified in Claim 1. This is also supported by the passage from paragraph [0034] mentioned above.

Concerning the § 102 rejections, it is axiomatic that anticipation under § 102 requires that the prior art reference disclose each and every element of the claim to which it is applied. In re King, 801 F.2d, 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986). Thus, there must be no differences between the subject matter of the claim and the disclosure of the prior art reference. Stated another way, the reference must contain within its four corners adequate direction to practice the invention as claimed. The corollary of the rule is equally applicable: Absence from the applied reference of any claimed element negates anticipation. Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

The claimed structure, as recited in the currently amended Claim 1 of the present application, is not anticipated by Chen or Hsu because neither enables different offsets in the depth of the buried strap with identical vertical lengths for collar regions. Applicants respectfully submit that the instant § 102 rejections have been obviated and withdrawal thereof is respectfully requested.

Claim 2 was amended to list all components of “each of said at least one other-type memory device”, which are another transistor, another underlying capacitor, a further-offset buried strap, and another collar region. An inherent property of another collar region was also specified, which is the vertical length of said another collar region, by qualifying said another collar region with the phrase “with another vertical length.” This is supported by paragraphs [0014] and [0024] of the specification that describes identical structure for the other-type

memory device as being identical to the second-type memory device except for differences in the vertical offset of a buried strap. See the discussions on the drawing above.

Claim 2 also amended to positively recite the between the “another vertical length” and the first vertical length. Since the “other-type memory device” has the same structure as the “second-type memory device” except for the vertical offset of their buried strap, the “another vertical length” is the same as the second vertical length, which is the same as the first vertical length” since Claim 2 depends on Claim 1.

Applicants respectfully submit that the claimed structure, as recited in the currently amended Claim 2 of the present application, is not anticipated by Chen or Hsu because neither enables different offsets in the depth of the buried strap with identical vertical lengths for collar regions.

In regard to Claim 3, Applicants respectfully submit that the claimed structure, as recited in Claim 3 of the present application, is not obvious over Hsu because the base Claim 1, on which Claim 3 depends, is neither anticipated by a combination of Chen and Hsu or obvious over Hsu.

Claim 4 was amended to positively recite the differences in the vertical height of bottling regions by adding the phrase, “wherein the depth of said at least one first-bottling region is different from the depth of said at least one offset-bottling region.” This is not an introduction of new matter. This is supported by figures 9 – 14 and also by paragraphs [0010], [0050], and [0051] wherein numerous references are made to the offset between the bottling regions belonging to different devices.

In regard to Claim 4, Applicants respectfully submit that the claimed structure, as recited in the currently amended Claim 4 of the present application, is not obvious over Hsu in view of

Mandelmann, because the base Claim 1, on which Claim 4 depends is neither anticipated by a combination of Chen and Hsu or obvious over Hsu in view of Mandelmann.

In regard to Claims 5, 6, and 10, Applicants respectfully submit that the claimed structure, as recited in Claim 5, 6, and 10 of the present application, is not anticipated by Chen or Hsu because the base Claim 1, on which Claims 5, 6, and 10 depend, is not anticipated by Chen or Hsu. -


In regard to Claim 7, Applicants respectfully submit that the claimed structure, as recited in Claim 7 of the present application, is not anticipated by Hsu because the base Claim 1, on which Claim 7 depends, is not anticipated by Chen or Hsu.

Claim 8 has been rewritten in an independent form including all limitations of Claim 1 prior to the current amendment, that is, including all limitations of Claim 1 in the previously amended form on which the Examiner's Final Office Action is based. Since Claim 9 depends on Claim 8 in the original form, Claim 9 has not been changed.

Applicants respectfully submit that Claims 8 and 9 should be allowable in the present form.

Thus, in view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,


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